

**ATTACHMENT A**

**Resolution No. R8-2004-0037**

To be submitted at a later date

**ATTACHMENT TO RESOLUTION NO. R8-2004-0037**

(Changes to the May 2004 version of the proposed Basin Plan amendment are shown as ~~strikeout~~ for deletions and underline for additions)

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**Amendment to the Santa Ana Region Basin Plan****Chapter 5 - Implementation Plan**

*(NOTE: The following language is proposed to be inserted into Chapter 5 of the Basin Plan. If the amendments are approved, corresponding changes will be made to the Table of Contents, the List of Tables, page numbers, and page headers in the plan. Due to the two-column page layout of the Basin Plan, the location of tables in relation to text may change during final formatting of the amendments. For formatting purposes, the maps may be redrawn for inclusion in the Basin Plan, and the final layout may differ from that of the draft.)*

**Lake Elsinore/San Jacinto River Watershed**

The Lake Elsinore/San Jacinto River Watershed is located in Riverside County and includes the following major waterbodies: Lake Hemet, San Jacinto River, Salt Creek, Canyon Lake and Lake Elsinore. The total drainage area of the San Jacinto River watershed is approximately 782 square miles. Over 90 percent of the watershed (735 square miles) drains into Canyon Lake. Lake Elsinore is the terminus of the San Jacinto River watershed. The local tributary area to Lake Elsinore, consisting of drainage from the Santa Ana Mountains and the City of Lake Elsinore, is 47 square miles.

Land use in the watershed includes open/forested, agricultural (including concentrated animal feeding operations such as dairies and chicken ranches, and irrigated cropland), and urban uses, including residential, industrial and commercial. Vacant/open space is being converted to residential uses as the population in the area expands. The municipalities in the watershed include the cities of San Jacinto, Hemet, Perris, Canyon Lake, Lake Elsinore and portions of Moreno Valley and Beaumont.

**1. Lake Elsinore and Canyon Lake Nutrient Total Maximum Daily Load (TMDL)**

Lake Elsinore and Canyon Lake are not attaining water quality standards due to excessive nutrients (nitrogen and phosphorus). Reports prepared by Regional Board staff describe the impact nutrient discharges have on the beneficial uses of Lake Elsinore and Canyon Lake [Ref. #1, 2] Lake Elsinore was formed in a geologically active graben area and has been in existence for thousands of years. Due to the mediterranean climate and watershed hydrology, fluctuations in the level of Lake Elsinore have been extreme, with alternate periods of a dry lake bed and extreme flooding. These drought/flood cycles have a great impact on lake water quality. Fish kills and excessive algae blooms have been reported in Lake Elsinore since the early 20th century. As a result, in 1994, the Regional Board placed Lake Elsinore on the 303(d) list of impaired waters due to excessive levels of nutrients and organic enrichment/low dissolved oxygen.

Canyon Lake, located approximately 2 miles upstream of Lake Elsinore, was formed by the construction of Railroad Canyon Dam in 1928. Approximately 735 square miles of the 782 square mile San Jacinto River watershed drain to Canyon Lake. During most years, runoff from the watershed terminates at Canyon Lake without reaching Lake Elsinore, resulting in the buildup of nutrients in Canyon Lake. While Canyon Lake does not have as severe an eutrophication problem as Lake Elsinore, there have been periods of algal blooms and anecdotal reports of occasional fish kills. Accordingly, in 1998, the Regional Board added Canyon Lake to the 303(d) list of impaired waters due to excessive levels of nutrients.

A TMDL technical report prepared by Regional Board staff describes the nutrient related problems in Canyon Lake and Lake Elsinore in greater detail and discusses the technical basis for the TMDLs that follows [Ref. # 3].

#### **A. Lake Elsinore and Canyon Lake Nutrient TMDL Numeric Targets**

Numeric targets for Lake Elsinore and Canyon Lake are based on reference conditions when beneficial uses in the lakes were not significantly impacted by- nutrients. ~~As shown in Table 5-9n shows,~~ both “causal” and “response” interim and final numeric targets ~~are specified~~ for both lakes. Causal targets are those for phosphorus and nitrogen. Phosphorus ~~and nitrogen are is~~ the primary limiting nutrients in Lake Elsinore ~~and Canyon Lake, respectively. However, under certain conditions, nitrogen may be limiting in Lake Elsinore and phosphorus may be limiting in Canyon Lake, and Canyon Lake, and nitrogen can be a limiting nutrient under certain conditions~~ Targets for both nutrients are therefore necessary. ~~Reduction in nitrogen inputs will be necessary over the long-term and only final targets are specified.~~ –Response targets include chlorophyll *a* and dissolved oxygen. These targets are specified to assess water quality improvements in the lakes. ~~Finally, ammonia targets are specified to prevent un-ionized ammonia toxicity to aquatic life.~~

Table 5-9n  
Lake Elsinore and Canyon Lake Nutrient TMDL Numeric Targets\*

Indicator	Lake Elsinore	Canyon Lake
Total P concentration (Interim)	Annual average no greater than 0.1 mg/L; to be attained no later than 2015	Annual average no greater than 0.1 mg/L; to be attained no later than 2015
Total P concentration (Final)	Annual average no greater than 0.05 mg/L; to be attained no later than 2020	Annual average no greater than 0.05 mg/L; to be attained no later than 2020
<del>Total N concentration (Interim)</del>	<del>Annual average no greater than 1.0 mg/L; to be attained no later than 2015</del>	<del>Annual average no greater than 1.0 mg/L; to be attained no later than 2015</del>
Total N concentration (Final)	Annual average no greater than <del>0.5</del> <u>0.75</u> mg/L; to be attained no later than 2020	Annual average no greater than <del>0.5</del> <u>0.75</u> mg/L; to be attained no later than 2020
<del>Ammonia nitrogen concentration (Final)</del> <del>[Ref. #4]</del>	<del>Calculated</del> <u>Specified concentrations to be attained no later than 2020</u>  <del>Acute: 1-hour average concentration of total ammonia nitrogen (mg/L) not to exceed, more than once every three years on the average, the CMC (acute criteria), where</del> <del><math display="block">\text{CMC} = \frac{0.411/(1+10^{7.204-\text{pH}})}{58.4/(1+10^{\text{pH}-7.204})}</math></del>  <del>Chronic: thirty-day average concentration of total ammonia nitrogen (mg/L) not to exceed, more than once every three years on the average, the CCC (chronic criteria)</del> <del><math display="block">\text{CCC} = \frac{(0.0577/(1+10^{7.688-\text{pH}}) + 2.487/(1+10^{\text{pH}-7.688})) * \min(2.85, 1.45 * 10^{0.028(25-\text{T})})}{(2.85, 1.45 * 10^{0.028(25-\text{T})})}</math></del>	<del>Calculated</del> <u>Specified concentrations to be attained no later than 2020</u>  <del>Acute: 1-hour average concentration of total ammonia nitrogen (mg/L) not to exceed, more than once every three years on the average, the CMC (acute criteria), where</del> <del><math display="block">\text{CMC} = \frac{0.411/(1+10^{7.204-\text{pH}})}{58.4/(1+10^{\text{pH}-7.204})}</math></del>  <del>Chronic: thirty-day average concentration of total ammonia nitrogen (mg/L) not to exceed, more than once every three years on the average, the CCC (chronic criteria)</del> <del><math display="block">\text{CCC} = \frac{(0.0577/(1+10^{7.688-\text{pH}}) + 2.487/(1+10^{\text{pH}-7.688})) * \min(2.85, 1.45 * 10^{0.028(25-\text{T})})}{(2.85, 1.45 * 10^{0.028(25-\text{T})})}</math></del>
Chlorophyll <i>a</i> concentration (Interim)	Summer average no greater than 40 ug/L; to be attained no later than 2015	Annual average no greater than 40 ug/L; to be attained no later than 2015
Chlorophyll <i>a</i> concentration (Final)	Summer average no greater than 25 ug/L; to be attained no later than 2020	Annual average no greater than 25 ug/L; to be attained no later than 2020
Dissolved oxygen concentration (Interim)	Depth average no less than 5 mg/L; to be attained no later than 2015	Minimum of 5 mg/L above thermocline <del>and no less than 2 mg/L in hypolimnion</del> ; to be attained no later than 2015
Dissolved oxygen concentration (Final)	No less than 5 mg/L 1 meter above lake bottom <del>and no less than 2 mg/L from 1 meter to lake sediment</del> ; to be attained no later than 2020	Daily average in hypolimnion no less than 5 mg/L; to be attained no later than 2020.

\* compliance with targets to be achieved as soon as possible, but no later than the date specified

## **B. Lake Elsinore and Canyon Lake Nutrient TMDLs, Wasteload Allocations, Load Allocations and Compliance Dates**

As discussed in the technical TMDL report, nutrient loading to Canyon Lake and Lake Elsinore varies depending on the hydrologic conditions that occur in the San Jacinto watershed. As part of the TMDL analysis and development, three hydrologic scenarios and the relative frequency of each of these conditions (based upon an 87 year record of flow data at the USGS Gauging station downstream of Canyon Lake), were identified as shown in Table 5-9o. The resulting TMDLs, wasteload allocations and load allocations are based on 10-year running flow weighted average nutrient loads, taking into account the frequency of the three hydrologic conditions and the nutrient loads associated with each of them. Phosphorus and nitrogen TMDLs for Canyon Lake and Lake Elsinore are shown in Table 5-9p. The TMDLs, expressed as 10-year running averages, that will implement the numeric targets, and thereby attain water quality standards, are shown in Table 5-9p. Phosphorus and nitrogen wWasteload allocations for point source discharges and load allocations for nonpoint source discharges, also expressed as 10-year running averages, are shown in Tables 5-9q and 5-9r. No TMDLs, wasteload allocations or load allocations are specified for chlorophyll a, dissolved oxygen or ammonia. Chlorophyll a and dissolved oxygen targets are intended to serve as measures of the effectiveness of phosphorus and nitrogen reductions implemented to meet TMDL requirements. Until ammonia transformations, and nitrogen dynamics in general, are better understood, no ammonia TMDLs, wasteload allocations or load allocations are specified.

Table 5-9o  
San Jacinto River Hydrologic Conditions with Relative Flow Frequency at the USGS Gauging Station  
Downstream of Canyon Lake (Station No. 1170500)

Hydrologic Condition	Representative Water Year	Years of Hydrologic Condition	Relative Frequency (%)	Description
Wet	1998	14	16	Both Canyon Lake and Mystic Lake overflow; flow at the USGS gauging station 11070500 17,000 AF or greater
Moderate	1994	36	41	No Mystic Lake overflow; Canyon Lake overflowed; flow at the USGS gauging station 11070500 less than 17,000 AF and greater than 271 AF
Dry	2000	37	43	No overflows from Mystic Lake or Canyon Lake; flow at the USGS gauging station 11070500 371 AF or less

Table 5-9p  
Nutrient TMDLs and Compliance Dates for Lake Elsinore and Canyon Lake

TMDL	Interim Total Phosphorus TMDL (kg/yr) <sup>a, c</sup>	Final Total Phosphorus TMDL (kg/yr) <sup>b, c</sup>	Interim Total Nitrogen TMDL (kg/yr) <sup>a, c</sup>	Final Total Nitrogen TMDL (kg/yr) <sup>b, c</sup>
Canyon Lake	8,691	6,689	45,795	37,735 29,672
Lake Elsinore	28,584	12,436	246,530	239,025 231,522

<sup>a</sup> Interim compliance to be achieved as soon as possible, but no later than December 31, 2015.

<sup>b</sup> Final compliance to be achieved as soon as possible, but no later than December 31, 2020.

<sup>c</sup> TMDL specified as 10-year running average.

Table 5-9q

Canyon Lake  
Nitrogen and Phosphorus Wasteload and Load Allocations<sup>a</sup>

Canyon Lake Nutrient TMDL	Interim Total Phosphorus Load Allocation (kg/yr) <sup>b, d</sup>	Final Total Phosphorus Load Allocation (kg/yr) <sup>c, d</sup>	Interim Total Nitrogen Load Allocation (kg/yr) <sup>b, d</sup>	Final Total Nitrogen Load Allocation (kg/yr) <sup>c, d</sup>
<b>TMDL</b>	<b>8,691</b>	<b>6,689</b>	<b>45,795</b>	<b>37,735 29,672</b>
<b>WLA</b>	<b>722</b>	<b>346</b>	<b>8,764</b>	<b>6,482 4,199</b>
Supplemental water	0	0	248	248
Urban	504	242	5,754	4,212 2,670
CAFO	218	105	2,763	2,023 1,282
<b>LA</b>	<b>7,969</b>	<b>6,343</b>	<b>37,031</b>	<b>31,253 25,473</b>
Internal Sediment	4,625	4,625	13,549	13,549
Atmospheric Deposition	221	221	1,918	1,918
Agriculture	1,948	934	10,980	8,035 5,095
Open/Forest	946	453	3,561	2,607 1,652
Septic systems	228	109	7,022	5,140 3,258

<sup>a</sup> The TMDL allocations for Canyon Lake apply to those land uses located upstream of Canyon Lake.

<sup>b</sup> Interim allocation compliance to be achieved as soon as possible, but no later than December 31, 2015.

<sup>c</sup> Final allocation compliance to be achieved as soon as possible, but no later than December 31, 2020.

<sup>d</sup> TMDL and allocations specified as 10-year running average.

Table 5-9r

Lake Elsinore  
Nitrogen and Phosphorus Wasteload and Load Allocations<sup>a</sup>

Lake Elsinore Nutrient TMDL	Interim Total Phosphorus Load Allocation (kg/yr) <sup>b, d</sup>	Final Total Phosphorus Load Allocation (kg/yr) <sup>c, d</sup>	<del>Interim Total Nitrogen Load Allocation (kg/yr)<sup>b, d</sup></del>	Final Total Nitrogen Load Allocation (kg/yr) <sup>c, d</sup>
<b>TMDL</b>	<b>28,584</b>	<b>12,436</b>	<b>246,530</b>	<b>239,025 231,522</b>
<b>WLA</b>	<b>3,845</b>	<b>816</b>	<b>7,982</b>	<b>7,847 7,712</b>
Supplemental water	3,721	744	7,442	7,442
Urban	124	72	540	405 270
CAFO	0	0	0	0
<b>LA</b>	<b>21,969</b>	<b>10,235</b>	<b>210,849</b>	<b>210,404 209,960</b>
Internal Sediment	21,554	9,948	197,370	197,370
Atmospheric Deposition	108	108	11,702	11,702
Agriculture	60	35	330	248 165
Open/Forest	178	104	505	379 252
Septic systems	69	40	942	706 474
CL Watershed <sup>e</sup>	2,770	1,385	27,699	20,774 13,850

<sup>a</sup> The Lake Elsinore TMDL allocations for urban, agriculture open/forest, septic systems and CAFOs only apply to those land uses located downstream of Canyon Lake.

<sup>b</sup> Interim allocation compliance to be achieved as soon as possible, but no later than December 31, 2015.

<sup>c</sup> Final allocation compliance to be achieved as soon as possible, but no later than December 31, 2020.

<sup>d</sup> TMDL and allocations specified as 10-year running average.

<sup>e</sup> Allocation for Canyon Lake overflows

The TMDL distributes the portions of the waterbody's assimilative capacity to various pollution sources so that the waterbody achieves its water quality standards. The Regional Board supports the trading of pollutant allocations among sources, where appropriate. Trading can take place between point/point, point/nonpoint, and nonpoint/nonpoint pollutant sources. Optimizing alternative point and nonpoint control strategies through allocation tradeoffs may be a cost-effective way to achieve pollution reduction benefits. [\(See Section E. TMDL Implementation, Task 11, below\).](#)

### **C. Margin of Safety**

The Canyon Lake and Lake Elsinore Nutrient TMDLs include an implicit margin of safety (MOS) as follows:

- the derivation of numeric targets based on the 25<sup>th</sup> percentile of data for both lakes;
- the use of multiple numeric targets to measure attainment of beneficial uses and thereby assure TMDL efficacy;
- [the](#) use of conservative literature values in the absence of site-specific data for source loading rates in the watershed nutrient model;
- [the](#) use of conservative assumptions in modeling the response of Lake Elsinore and Canyon Lake to nutrient loads; and
- requiring load reductions to be accomplished during hydrological conditions when model results indicate, in some instances, that theoretical loads could be higher.

### **D. Seasonal Variations/Critical Conditions**

The Canyon Lake and Lake Elsinore Nutrient TMDLs account for seasonal and annual variations in external and internal nutrient loading and associated impacts on beneficial uses; by the use of a 10-year running average allocation approach. This 10-year running average approach addresses variation in hydrologic conditions (wet, moderate and dry) that can dramatically affect both nutrient loading and lake response.

Compliance with numeric targets will ensure water quality improvements that prevent excessive algae blooms and fish kills, particularly during the critical summer period when these problems are most likely to occur.

### **E. TMDL Implementation**

Typically, under dry and moderate conditions, the internal nutrient loading drives the nutrient dynamics in both Canyon Lake and Lake Elsinore. However, it is the extreme (albeit infrequent) loading that occurs during wet conditions that provides the nutrients to the lakes that remain in the lakes as internal nutrient sources in subsequent years. Given the complexity of the San Jacinto River watershed hydrology, control of nutrients input to the lakes is needed for all hydrologic conditions. Collection of additional monitoring data is critical to developing long-term solutions for nutrient control. With that in mind, the submittal of plans and schedules [to implement the TMDLs](#) should take into consideration the need to develop and implement effective short-term solutions, as well as allow for the development of long-term solutions once additional data have been generated.

Implementation of tasks and schedules as specified in Table 5-9s; is expected to achieve compliance with water quality standards. Each of these tasks is described below.



Table 5-9s

**Lake Elsinore and Canyon Lake Nutrient TMDL Implementation  
Plan/Schedule Report Due Dates**

<b>Task</b>	<b>Description</b>	<b>Compliance Date-As soon As Possible but No Later Than</b>
<b><i>TMDL Phase 1</i></b>		
Task 1	Establish New Waste Discharge Requirements	(*6 months after BPA approval*)
Task 2	Revise Existing Waste Discharge Permits	(*6 months after BPA approval*)
Task 3	Watershed-wide Nutrient Water Quality Monitoring Program 3.1 Watershed-wide Nutrient Monitoring Plan(s) 3.2 Lake Elsinore Nutrient Monitoring Plan(s) 3.3 Canyon Lake Nutrient Monitoring Plan(s)	Plan/schedule due (*3 months after BPA approval*) Annual reports due August 15
Task 4	Agricultural Discharges – Nutrient Management Plan	Plan/schedule due (*2 years after BPA approval*)
Task 5	On-site Disposal Systems (Septic Systems) Management Plan	<del>Plan/schedule due (*6 months after BPA approval*)</del> <u>Dependent on State Board approval of relevant regulations (see text).</u>
Task 6	Urban Discharges  6.1 Revision of Drainage Area Management Plan (DAMP) 6.2 Revision of the Water Quality Management Plan (WQMP) 6.3 Update of the Caltrans Stormwater Management Plan and Regional Plan 6.4 <u>Update of</u> US Air Force, March Air Reserve Base <u>SWPPP</u>	Plan/schedule due: <del>(*6 months after BPA approval*)</del> <u>6.1 August 1, 2006</u> <u>6.2 August 1, 2006</u> <u>6.3 April 1, 2006</u> <u>6.4 Dependent on Task 3 results. See text.</u>
Task 7	Forest Area – Review/Revision of Forest Service Management Plans	Plan/schedule due (*2 years after BPA approval*)
Task 8	Lake Elsinore Lake In-Lake Sediment Nutrient Reduction Plan	Plan/schedule due (*6 months after BPA approval*)*
Task 9	Canyon Lake In-Lake Sediment Treatment Evaluation	Plan/schedule due (*6 months after BPA approval*)
Task 10	Watershed and Canyon Lake and Lake Elsinore In-Lake Model Updates	Plan/schedule due (*6 months after BPA approval*)
<u>Task 11</u>	<u>Pollutant Trading Plan</u>	<u>Plan/schedule due (*2 years after BPA approval*)</u>
Task 1 <u>4</u> <u>2</u>	Review and Revise Nutrient Water Quality Objectives	December 31, 2009
Task 1 <u>2</u> <u>3</u>	Review of TMDL/WLA/LA	Once every 3 years to coincide with the Regional Board's triennial review

**[Note: BPA => Basin Plan Amendment]**

**Task 1: Establish New Waste Discharge Requirements**

On or before (*\*6 months from the effective date of this BPA*), the Regional Board shall issue new waste discharge requirements (NPDES permit) to Elsinore Valley Municipal Water District for supplemental water discharges to Canyon Lake that incorporate the appropriate interim and final wasteload allocations, compliance schedule and monitoring program requirements.

Other proposed nutrient discharges will be addressed and permitted as appropriate.

**Task 2: Review and/or Revise Existing Waste Discharge Requirements**

There are five Waste Discharge Requirements (WDRs) issued by the Regional Board regulating discharge of various types of wastes in the San Jacinto watershed. On or before (*\*6 months from the effective date of this Basin Plan amendment\**), each of these WDRs shall be reviewed and revised as necessary to implement the Lake Elsinore and Canyon Lake Nutrient TMDLs, including the appropriate nitrogen and phosphorus interim and final wasteload allocations, compliance schedules and/or monitoring program requirements.

- 2.1 Waste Discharge Requirements for the Riverside County Flood Control and Water Conservation District, the County of Riverside and the Incorporated Cities of Riverside County within the Santa Ana Region, Areawide Urban Runoff, NPDES No. CAS 618033 (Regional Board Order No. R8-2002-0011). The current Order has provisions to address TMDL issues (see Task 6.1, below). In light of these provisions, revision of the Order may not be necessary to address TMDL requirements.
- 2.2 Watershed-Wide Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with New Developments in the San Jacinto Watershed, Order No. 01-34, NPDES No. CAG 618005. It is expected that this Order will be rescinded once the Regional Board/Executive Officer approves a Water Quality Management WQMP) under Order No. R8-2002-0011 (see 2.1, above and Task 6.2, below)
- 2.3 General Waste Discharge Requirements for Concentrated Animal Feeding Operations (Dairies and Related Facilities) within the Santa Ana Region, NPDES No. CAG018001 (Regional Board Order No. 99-11).
- 2.4 Waste Discharge and Producer/User Reclamation Requirements for the Elsinore Valley Municipal Water District, Regional Water Reclamation Facility Riverside County, Order No. 00-1, NPDES No. CA8000027. Revised permit specifications will take into consideration the Lake Elsinore Recycled Water Pilot Project findings.
- 2.5 Waste Discharge Requirements for Eastern Municipal Water District, Regional Water Reclamation System, Riverside County, Order No. 99-5, NPDES No. CA8000188. Revised permit specifications will take into consideration the Lake Elsinore Recycled Water Pilot Project findings.
- 2.6 Waste Discharge Requirements for US Air Force, March Air Reserve Base, Storm Water Runoff, Riverside County, Order No. 99-6, NPDES CA 00111007

### Task 3: Monitoring

#### 3.1 Watershed-wide Nutrient Water Quality Monitoring Program

No later than (*\*3 months from effective date of this Basin Plan amendment \**), the US Forest Service, the US Air Force (March Air Reserve Base), March Joint Powers Authority, ~~the State of California~~, Department of Transportation (Caltrans), ~~the State of California~~, Department of Fish and Game, the County of Riverside, the cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Murrieta, Riverside and Beaumont, Eastern Municipal Water District, Elsinore Valley Municipal Water District, concentrated animal feeding operators and other agricultural operators within the San Jacinto watershed shall, as a group, submit to the Regional Board for approval a proposed watershed-wide nutrient monitoring program that will provide data necessary to review and update the Lake Elsinore and Canyon Lake Nutrient TMDL. Data to be collected and analyzed shall address, at a minimum: (1) determination of compliance with interim and/or final nitrogen and phosphorus allocations; and (2) determination of compliance with the nitrogen and phosphorus TMDL, including the WLAs and LAs.

At a minimum, ~~the proposed plan shall include the collection of samples at~~ the stations specified in Table 5-9t and shown in Figure 5-3, at the frequency specified in Table 5-9t, ~~st, shall be considered for inclusion in the proposed monitoring plan. If one or more of these monitoring stations are not included, rationale shall be provided and proposed alternative monitoring locations shall be identified in the proposed monitoring plan.~~ In addition to water quality samples, at a minimum, daily discharge (stream flow) determinations shall be made at all stations shown in Table 5-9t.

At a minimum, samples shall be analyzed for the following constituents:

- |                                  |                                |
|----------------------------------|--------------------------------|
| • organic nitrogen               | • nitrate nitrogen             |
| • nitrite nitrogen               | • ortho-phosphate (SRP)        |
| • total phosphorus               | • total dissolved solids (TDS) |
| • total hardness                 | • turbidity                    |
| • total suspended solids (TSS)   | • chemical oxygen demand (COD) |
| • biological oxygen demand (BOD) | • <u>pH</u>                    |
| • ammonia nitrogen               | • <u>water temperature</u>     |

The proposed monitoring plan shall be implemented upon Regional Board approval at a duly noticed public meeting. An annual report summarizing the data collected for the year and evaluating compliance with the WLAs/LAs shall be submitted by August 15 of each year.

In lieu of this coordinated monitoring plan, one or more of the parties identified above may submit a proposed individual or group monitoring plan for Regional Board approval. Any such individual or group monitoring plan is due no later than (*\*3 months from effective date of this Basin Plan amendment\**) and shall be implemented upon Regional Board approval at a duly noticed public meeting. An annual report of data collected pursuant to approved individual/group plan(s) shall be submitted by August 15 of each year. The report shall summarize the data and evaluate compliance with the WLAs/LAs.

It may be that implementation of these monitoring requirements will be required through the issuance of Water Code Section 13267 letters to the affected parties. The monitoring plan(s) will be considered by the Regional Board and implemented upon the Regional Board's approval.

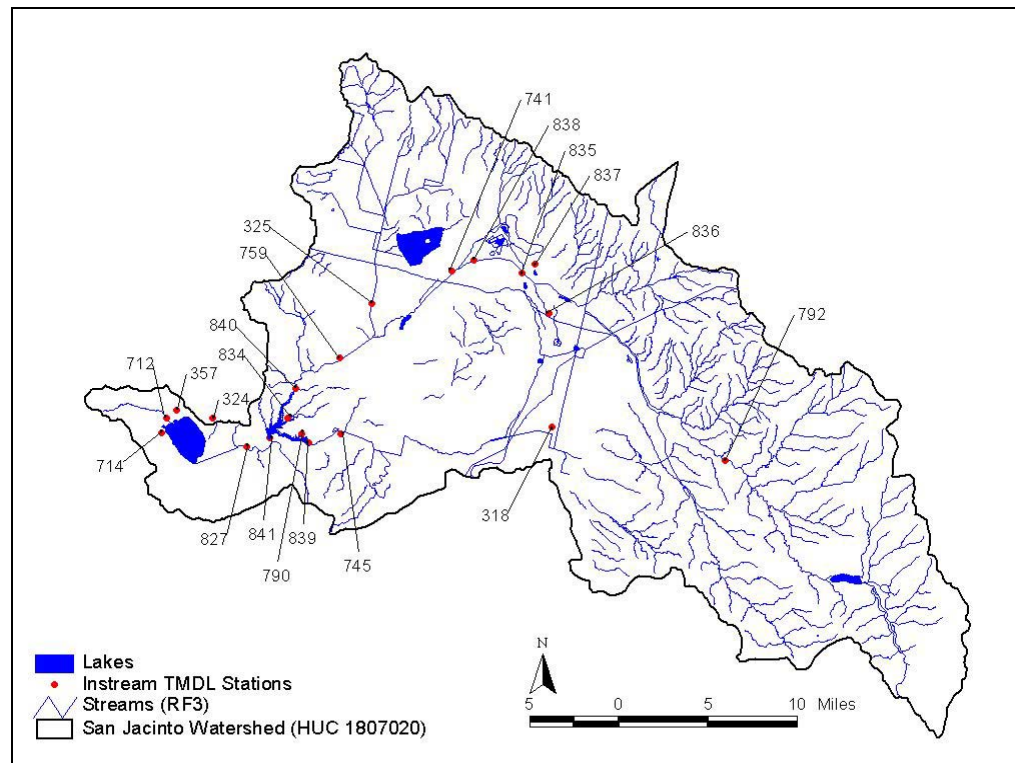


Figure 5-3 – San Jacinto River Watershed Nutrient TMDL Water Quality Stations Locations

Table 5-9t  
Lake Elsinore and Canyon Lake Watershed  
Minimum Required Sampling Station Locations

Station Number	Station Description
792	San Jacinto River @ Cranston Guard Station
318	Hemet Channel at Sanderson Ave.
745	Salt Creek @ Murrieta Road
759	San Jacinto River @ Goetz Rd
325	Perris Valley Storm Drain @ Nuevo Rd.
741	San Jacinto River @ Ramona Expressway
827	San Jacinto River upstream of Lake Elsinore
790	Fair Weather Dr. Storm Drain in Canyon Lake
357	4 Corners Storm Drain in Elsinore
714	Ortega Flood Channel in Elsinore
324	Lake Elsinore Outlet Channel
712	Leach Canyon Channel in Elsinore
834	Sierra Park Drain in Canyon Lake
835	Bridge Street and San Jacinto River
836	North Side of Ramona Expressway near Warren Road
837	Mystic Lake inflows
838	Mystic Lake outflows
841	Canyon Lake spillway

Frequency of sampling at all stations: dry season – none;  
wet season; minimum of 3 storms/year whenever possible  
and 8 samples across each storm hydrograph

### 3.2 Lake Elsinore: In-Lake Nutrient Monitoring Program

No later than (\*3 months from effective date of this Basin Plan amendment \*), the US Forest Service, the US Air Force (March Air Reserve Base), March Joint Powers Authority, ~~the State of California~~, Department of Transportation (Caltrans), ~~the State of California~~, Department of Fish and Game, the County of Riverside, the cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Murrieta, Riverside and Beaumont, Eastern Municipal Water District, Elsinore Valley Municipal Water District, concentrated animal feeding operators and other agricultural operators within the San Jacinto watershed shall, as a group, submit to the Regional Board for approval a proposed Lake Elsinore nutrient monitoring program that will provide data necessary to review and update the Lake Elsinore Nutrient TMDL. Data to be collected and analyzed shall address, at a minimum: determination of compliance with interim and final nitrogen, phosphorus, chlorophyll *a*, and dissolved oxygen numeric targets. In addition, the monitoring program shall evaluate and determine the relationship between ammonia toxicity and the total nitrogen allocation to ensure that the total nitrogen allocation will prevent ammonia toxicity in Lake Elsinore.

At a minimum, the proposed plan shall include the collection of samples at the stations specified in Table 5-9u and shown in Figure 5-4, at the specified frequency indicated in Table 5-9u. With the exception of dissolved oxygen and water temperature, all samples to be analyzed shall be depth integrated.

The monitoring plan shall be implemented upon Regional Board approval at a duly noticed public meeting. An annual report summarizing the data collected for the year and evaluating compliance with the TMDL shall be submitted by August 15 of each year.

Table 5-9u  
Lake Elsinore Minimum Required Sampling Station Locations

Station Number	Station Description
LE 14	Lake Elsinore – inlet
LE 15	Lake Elsinore – four corners
LE 16	Lake Elsinore – mid-lake

Frequency of sampling at all stations: monthly October through May; bi-weekly June through September.

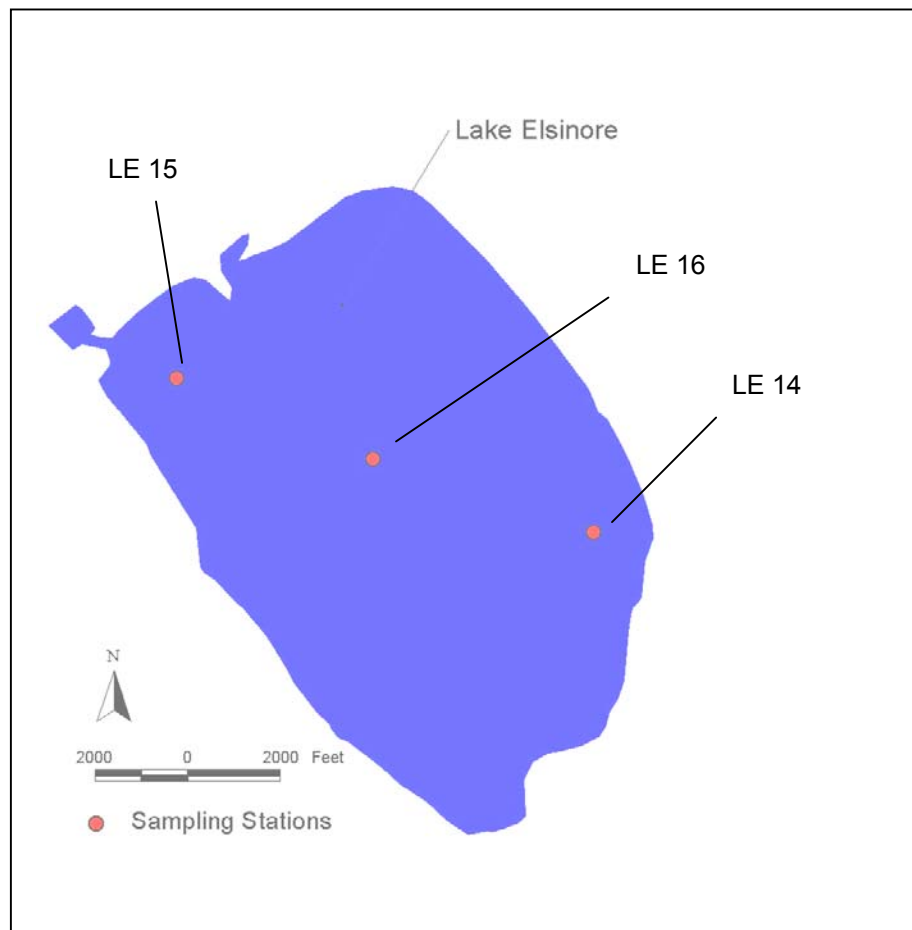


Figure 5-4 Lake Elsinore TMDL monitoring Stations

At a minimum, in-lake samples must be analyzed for the following constituents:

- specific conductance
- water temperature
- pH
- chlorophyll *a*
- organic nitrogen
- nitrite nitrogen
- organic phosphorus
- total hardness
- total dissolved solids (TDS)
- chemical oxygen demand (COD)
- dissolved oxygen
- water clarity (secchi depth)
- ammonia nitrogen
- nitrate nitrogen
- turbidity
- ortho-phosphate (SRP)
- total suspended solids (TSS)
- biological oxygen demand (BOD)

In lieu of this coordinated monitoring plan, one or more of the parties identified above may submit a proposed individual or group monitoring plan for Regional Board approval. Any such individual or group monitoring plan is due no later than (*\*3 months from effective date of this Basin Plan amendment \**) and shall be implemented upon Regional Board approval at a duly noticed public meeting. An annual report of data collected pursuant to approved individual/group plan(s), shall be submitted by August 15 of each year. The report shall summarize the data and evaluate compliance with the numeric targets.

It may be that implementation of these requirements will be required through the issuance of Water Code Section 13267 letters to the affected parties. The monitoring plan(s) will be considered by the Regional Board and implemented upon the Regional Board's approval.

### 3.3 Canyon Lake Nutrient Monitoring Program

No later than (*\*3 months from effective date of this Basin Plan amendment \**), the US Forest Service, the US Air Force (March Air Reserve Base), March Joint Powers Authority, ~~the State of California~~, Department of Transportation (Caltrans), ~~the State of California~~, Department of Fish and Game, the County of Riverside, the cities of Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Murrieta, Riverside and Beaumont, Elsinore Valley Municipal Water District, concentrated animal feeding operators and other agricultural operators within the San Jacinto watershed shall, as a group, submit to the Regional Board for approval a proposed Canyon Lake nutrient monitoring program that will provide data necessary to review and update the Canyon Lake Nutrient TMDL. Data to be collected and analyzed shall address, at a minimum: determination of compliance with interim and final nitrogen, phosphorus, chlorophyll *a*, and dissolved oxygen numeric targets. In addition, the monitoring program shall evaluate and determine the relationship between ammonia toxicity and the total nitrogen allocation to ensure that the total nitrogen allocation will prevent ammonia toxicity in Canyon Lake.

At a minimum, the proposed plan shall include the collection of samples at the stations specified in Table 5-9v and shown in Figure 5-5, at the specified frequency indicated in Table 5-9v. Discrete samples in Canyon Lake are to be collected in the epilimnion, hypolimnion and thermocline when and where appropriate.

The monitoring plan shall be implemented upon Regional Board approval at a duly noticed public meeting. An annual report summarizing the data collected for the year and evaluating compliance with the TMDL shall be submitted by August 15 of each year.

Table 5-9v

Canyon Lake Minimum Required Sampling Station Locations

Station Number	Station Description
CL 07	Canyon Lake – At the Dam
CL 08	Canyon Lake – North Channel
CL 09	Canyon Lake – Canyon Bay
CL 10	Canyon Lake – East Bay

Frequency of sampling at all stations: monthly October through May; bi-weekly June through September.



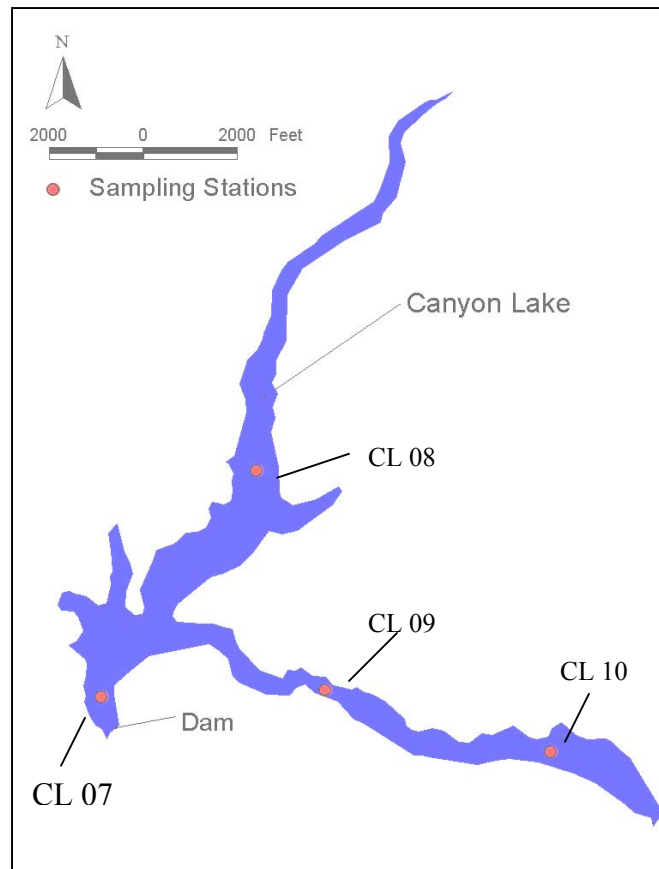


Figure 5-5 – Canyon Lake Nutrient TMDL Monitoring Station Locations

At a minimum, in-lake samples must be analyzed for the following constituents:

- specific conductance
- water temperature
- pH
- chlorophyll *a*
- organic nitrogen
- nitrite nitrogen
- organic phosphorus
- total hardness
- total dissolved solids (TDS)
- chemical oxygen demand (COD)
- dissolved oxygen
- water clarity (secchi depth)
- ammonia nitrogen
- nitrate nitrogen
- turbidity
- ortho-phosphate (SRP)
- total suspended solids (TSS)
- biological oxygen demand (BOD)

In lieu of this coordinated monitoring plan, one or more of the parties identified above may submit a proposed individual or group monitoring plan for Regional Board approval. Any such individual or group monitoring plan is due no later than (*\*3 months from effective date of this Basin Plan amendment\**) and shall be implemented upon Regional Board approval at a duly noticed public meeting. An annual report of data collected pursuant to approved individual/group plan(s) shall be submitted by August 15 of each year. The report shall summarize the data and evaluate compliance with the numeric targets.

It may be that implementation of these requirements will be required through the issuance of Water Code Section 13267 letters to the affected parties. The monitoring plan(s) will be considered by the Regional Board and implemented upon the Regional Board's approval.

#### **Task 4: Agricultural Activities**

No later than (*\*2 years from effective date of this Basin Plan amendment \**), the Riverside County Farm Bureau, the UC Cooperative Extension, Western Riverside County Ag Coalition and agricultural operators within the Lake Elsinore and Canyon Lake watershed shall, as a group, submit a proposed Nutrient Management Plan (NMP). The Nutrient Management Plan shall be implemented upon Regional Board approval at a duly noticed public meeting.

In lieu of a coordinated plan, one or more of the parties identified above may submit a proposed individual or group Nutrient Management Plan to conduct the above studies for areas within their jurisdiction. Any such individual or group plan shall also be submitted for Regional Board approval no later than (*\*2 years from effective date of this Basin Plan amendment \**). This Nutrient Management Plan shall be implemented upon Regional Board approval at a duly noticed public meeting.

At a minimum, the NMP shall include, plans and schedules for the following:

- implementation of nutrient controls, BMPs and reduction strategies designed to meet load allocations;
- evaluation of effectiveness of BMPs;
- development and implementation of compliance monitoring; and
- development and implementation of focused studies that will provide the following data and information
  - inventory of crops grown in the watershed;
  - amount of manure and/or fertilizer applied to each crop with corresponding nitrogen and phosphorus amounts; and
  - amount of nutrients discharged from croplands.

The Regional Board expects that the NMP will be submitted and implemented on a voluntary basis. Where and when necessary to implement these requirements, the Regional Board will issue appropriate waste discharge requirements.

Compliance with the agricultural load allocation may be achieved through a Regional Board approved pollutant trading program.

#### **Task 5: On-site Disposal Systems (Septic System) Management Plan**

No later than ~~(*\*6 months from effective date of this Basin Plan amendment \**)~~ 6 months of the effective date of an agreement between; the County of Riverside and the Regional Board to implement regulations

adopted pursuant to Water Code Sections 13290-13291.7, or if no such agreement is required or completed, within 12 months of the effective date of these regulations, the County of Riverside and the Cities of Perris, Moreno Valley and Murrieta shall, as a group, submit a Septic System Management Plan to identify and address nutrient discharges from septic systems within the San Jacinto watershed. The Septic System Management Plan shall implement regulations adopted by the State Water Resources Control Board pursuant to California Water Code Section 13290 – 13291.7.

At a minimum, the Septic System Management Plan shall include plans and schedules for the development and implementation of the following:

- public education program;
- tracking system, including maintenance thereof;
- maintenance standards;
- enforcement provisions;
- monitoring program; and
- sanitary survey.

In lieu of a coordinated plan, one or more of the agencies with septic system oversight responsibilities may submit an individual or group Management Plan to develop the above Plan for areas within their jurisdiction. Any such individual or group plan shall also be submitted no later than (*\*6 months from effective date of this Basin Plan amendment \**). This Septic System Management Plan shall be implemented upon Regional Board approval at a duly noticed public meeting.

Compliance with the septic systems load allocation may be achieved through a Regional Board approved pollutant trading program.

#### **Task 6: Urban Discharges**

Urban discharges including stormwater runoff, includes those from the cities and unincorporated communities in the San Jacinto River watershed. These discharges are regulated under the [Riverside County MS4 NPDES permit](#). Nuisance and stormwater runoff from state highways and right of ways is regulated under the State of California, Department of Transportation (Caltrans) statewide general NPDES permit. Finally, nuisance and stormwater runoff from the March Air Reserve Base is also regulated through an NPDES permit.

##### **6.1 Revision to the Drainage Area Management Plan (DAMP)**

Provision XIII.B. of Order No. R8-2002-0011 (see 2.1, above) requires the permittees to revise their Drainage Area Management Plan (DAMP) to include TMDL requirements. ~~Each year, by~~ By August 1, 2006, the permittees ~~shall be required to~~ review and revise their DAMP as necessary to address the requirements of these nutrient TMDLs. Further review and revision of the DAMP needed to address these TMDLs shall be completed in accordance with the requirements of Order No. R8-2002-0011 or amendments/updates thereto that are adopted by the Regional Board at a public hearing. The DAMP ~~se~~ revisions shall include schedules for meeting the interim and final nutrient wasteload allocations. The co-permittees shall also provide a proposal for 1) evaluating the effectiveness of BMPs and other control actions implemented and 2) evaluating compliance with the nutrient waste load allocation for urban runoff. The proposal must be implemented upon Regional Board approval at a duly noticed public meeting.

##### **6.2 Revision of the Water Quality Management Plan (WQMP)**

Provision VIII.B. of Order No. R8-2002-0011 (see 2.1, above) requires the permittees to develop and submit a WQMP by June 2004 for the Executive Officer's approval. By August 1, 2006, the permittees shall submit a revised ~~The~~ WQMP that shall addresses the nutrient input from new developments and significant redevelopments to assure compliance with the nutrient wasteload allocations for urban runoff. The WQMP shall also address requirements currently in Order No. 01-34 (see 2.2, above). Once the WQMP is approved, Order No. 01-34 will be rescinded. Further review and revision of the WQMP necessary to assure that TMDL requirements are addressed shall be completed in accordance with the requirements of Order No. R8-2002-0011 or amendments/updates thereto that are adopted by the Regional Board at a public hearing.

#### 6.3 Revision of the State of California, Department of Transportation (Caltrans) Stormwater Permit

Provision E.1 of Order No. 99-06-DWQ requires Caltrans to maintain and implement a Storm Water Management Plan (SWMP). Annual updates of the SWMP needed to maintain an effective program; are required to be submitted to the State Water Resources Control Board.

Provision E.2 of Order No. 99-06-DWQ requires Caltrans to submit a Regional Workplan by April 1 of each year for the Executive Officer's approval. By April 1, 2006, Caltrans shall submit a ~~The~~ Regional Workplan that shall includes plans and schedules for meeting the interim and final nutrient wasteload allocations, and provides a proposal for 1) evaluating the effectiveness of BMPs and other control actions implemented and 2) evaluating compliance with the nutrient waste load allocations for urban runoff, which includes runoff from Caltrans facilities. The proposal shall be implemented upon the Executive Officer's approval. Annual updates to the Regional Workplan shall include, as necessary, revised plans and schedules for meeting the interim and final nutrient wasteload allocations and revised proposals for evaluating the efficacy of control actions and compliance with the nutrient wasteload allocations.

#### 6.4 Revision to the United States Air Force, March Air Reserve Base, Stormwater Permit

Order No. 99-6 specifies monitoring and report requirements for stormwater runoff from the US Air Force, March Air Reserve facility. Provision B.11.a and B.11.b requires that March Air Reserve Base submit a report and revise the Stormwater Pollution Prevention Plan (SWPPP) to address any pollutants that may be causing or contributing to exceedances of water quality standards. Results from the TMDL nutrient monitoring program conducted pursuant to Task 3, shall serve as the basis for revision of the SWPPP.

Development of the Municipal permittee's WQMP and revisions to their DAMP, development of the Caltrans SWMPWQMP and Regional Workplan, and Revision to the March Air Reserve Base SWPPP, shall address the urban component of the nutrient TMDL.

Compliance with the urban wasteload allocation may be achieved through a Regional Board approved pollutant trading program.

### Task 7: Forest Area – Revision of Forest Service Management Plans

No later than (\*2 years from effective date of this Basin Plan amendment \*), the US Forest Service shall submit for approval a plan and schedule for review and revision of the Cleveland National Forest Service Management Plan and the San Bernardino National Forest Service Management Plan to identify watershed-specific appropriate Best Management Practices (BMPs) that will be implemented to achieve

the interim and final load allocations for forest/open space. The proposal shall include specific recommendations for 1) evaluating the effectiveness of control actions implemented to reduce nutrient discharges from forest/open space and 2) evaluating compliance with the nutrient load allocation from forest/open space. The revised watershed-specific BMPs shall be implemented upon Regional Board approval at a duly noticed public meeting.

Compliance with the open space/forest load allocation may be achieved through a Regional Board approved pollutant trading program.

#### **Task 8: Lake Elsinore Sediment Nutrient Reduction Plan**

No later than (*\*6 months from effective date of this Basin Plan amendment \**), the US Forest Service, the US Air Force (March Air Reserve Base), March Joint Powers Authority, the State of California, Department of Transportation (Caltrans), the State of California, Department of Fish and Game, the County of Riverside, the cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Murrieta, Riverside and Beaumont, Eastern Municipal Water District, Elsinore Valley Municipal Water District, concentrated animal feeding operators and other agricultural operators within the San Jacinto watershed shall, as a group, submit to the Regional Board for approval a proposed plan and schedule for in-lake sediment nutrient reduction for Lake Elsinore. The proposed plan shall include an evaluation of the applicability of various in-lake treatment technologies to prevent the release of nutrients from lake sediments to support development of a long-term strategy for control of nutrients from the sediment. The submittal shall also contain a proposed sediment nutrient monitoring program to evaluate the effectiveness of any strategies that are implemented. The Lake Elsinore In-lake Sediment Nutrient Reduction Plan shall be implemented upon Regional Board approval at a duly noticed public meeting.

In lieu of this coordinated ~~monitoring~~ plan, one or more of the parties identified above may submit a proposed individual or group In-lake Sediment Nutrient Reduction Plan for approval by the Regional Board. Any such individual or group Plan is due no later than (*\*6 months from effective date of this Basin Plan amendment\**) and shall be implemented upon Regional Board approval at a duly noticed public meeting.

Compliance with the Lake Elsinore Sediment Nutrient Reduction Plan requirement may be achieved through a Regional Board approved pollutant trading program.

#### **Task 9: Canyon Lake Sediment Nutrient Treatment Evaluation Plan**

No later than (*\*6 months from effective date of this Basin Plan amendment \**), the US Forest Service, the US Air Force (March Air Reserve Base), March Joint Powers Authority, ~~the State of California~~, Department of Transportation (Caltrans), ~~the State of California~~, Department of Fish and Game, the County of Riverside, the cities of Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Murrieta, Riverside and Beaumont, Elsinore Valley Municipal Water District, concentrated animal feeding operators and other agricultural operators within the San Jacinto watershed shall, as a group, submit to the Regional Board for approval a proposed plan and schedule for evaluating in-lake sediment nutrient treatment strategies for Canyon Lake. The proposed plan shall include an evaluation of the applicability of various in-lake treatment technologies to prevent the release of nutrients from lake sediments in order to develop a long-term strategy for control of nutrients from the sediment. The submittal shall also contain a proposed sediment nutrient monitoring program to evaluate the effectiveness of any strategies that are implemented. The Canyon Lake In-lake Sediment Nutrient Treatment Plan shall be implemented upon Regional Board approval at a duly noticed public meeting.

In lieu of this coordinated ~~monitoring~~ plan, one or more of the parties identified above may submit a proposed individual or group In-lake Sediment Nutrient Treatment Evaluation Plan for approval by the Regional Board. Any such individual or group Plan is due no later than (*\*6 months from effective date of this Basin Plan amendment\**) and shall be implemented upon Regional Board approval at a duly noticed public meeting.

#### **Task 10: Update of Watershed and In-Lake Nutrient Models**

No later than (*\*6 months from effective date of this Basin Plan amendment \**), the US Forest Service, the US Air Force (March Air Reserve Base), March Joint Powers Authority, ~~the State of California~~, Department of Transportation (Caltrans), ~~the State of California~~, Department of Fish and Game, the County of Riverside, the cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Riverside and Beaumont, Eastern Municipal Water District, Elsinore Valley Municipal Water District, concentrated animal feeding operators and other agricultural operators shall, as a group, submit to the Regional Board for approval a proposed plan and schedule for updating the existing Lake Elsinore/San Jacinto River Nutrient Watershed Model and the Canyon Lake and Lake Elsinore in-lake models. The plan and schedule must take into consideration additional data and information that are generated from the respective TMDL monitoring programs. The plan for updating the Watershed and In-lake Models shall be implemented upon Regional Board approval at a duly noticed public meeting.

In lieu of this coordinated plan, one or more of the parties identified above may submit a proposed individual or group plan for update of the Lake Elsinore/San Jacinto River Nutrient Watershed Model and the Canyon Lake and Lake Elsinore in-lake models. The plan and schedule must take into consideration additional data and information that are generated from the respective TMDL monitoring programs. Any such individual or group Plan is due no later than (*\*6 months from effective date of this Basin Plan amendment\**) and shall be implemented upon Regional Board approval at a duly noticed public meeting.

#### **Task 11: Pollutant Trading Plan**

No later than (*\*2 years from effective date of this Basin Plan amendment \**), the US Forest Service, the US Air Force (March Air Reserve Base), March Joint Powers Authority, California Department of Transportation (Caltrans), California Department of Fish and Game, the County of Riverside, the cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Riverside and Beaumont, Eastern Municipal Water District, Elsinore Valley Municipal Water District, concentrated animal feeding operators and other agricultural operators shall, as a group, submit to the Regional Board for approval a proposed Pollutant Trading Plan. At a minimum, this plan shall contain a plan, schedule and funding strategy for project implementation, an approach for tracking pollutant credits and a schedule for reporting status of implementation of the Pollutant Trading Plan to the Regional Board. -The Pollutant Trading Plan shall be implemented upon Regional Board approval at a duly noticed public meeting.

In lieu of this coordinated plan, one or more of the parties identified above may submit a proposed individual or group Pollutant Trading Plan. Any such individual or group Plan is due no later than (*\*2 years from effective date of this Basin Plan amendment\**) and shall be implemented upon Regional Board approval at a duly noticed public meeting.

#### **Task 14~~2~~: Review and Revision of Water Quality Objectives**

By December 31, 2009, the Regional Board shall review and revise as necessary the total inorganic nitrogen numeric water quality objectives for Lake Elsinore and Canyon Lake. In addition, the Regional Board shall evaluate the appropriateness of establishing total phosphorus ~~and site-specific un-ionized~~

**ammonia** numeric water quality objectives for both Lake Elsinore and Canyon Lake. Given budgetary constraints, completion of this task is likely to require substantive contributions from interested parties.

### **Task 123: Review/Revision of the Lake Elsinore/Canyon Lake Nutrient TMDL**

The basis for the TMDLs and implementation schedule will be re-evaluated at least once every three years<sup>1</sup> to determine the need for modifying the load allocations, numeric targets and TMDLs. Regional Board staff will continue to review all data and information generated pursuant to the TMDL requirements on an ongoing basis. Based on results generated through the monitoring programs, special studies, ~~and/or~~ modeling analysis, ~~and/or responsible party's special studies by one or more responsible parties,~~ changes to the TMDL, including revisions to the numeric targets, may be warranted. Such changes would be considered through the Basin Plan Amendment process.

The Regional Board is committed to the review of this TMDL every three years, or more frequently if warranted by these or other studies

### **References**

1. California Regional Water Quality Control Board, Lake Elsinore Nutrient TMDL Problem Statement, October, 2000.
2. California Regional Water Quality Control Board, Canyon Lake Nutrient TMDL Problem Statement, October 2001.
3. California Regional Water Quality Control Board, Total Maximum Daily Load for Nutrients in Lake Elsinore And Canyon Lake, May 2004
4. Environmental Protection Agency, Update of Ambient Water Quality Criteria for Ammonia. EPA-822-R-99-014, 1999.

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<sup>1</sup> The three-year schedule will coincide with the Regional Board's triennial review schedule.